

General Arboriculture Safety Standards and Practices



Presented by:

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Arboriculture Work

Arboriculture work, including:

- Tree inspection
- Pruning
- Chipping
- Installation of support systems; and
- Felling

is required to ensure healthy and safe trees



Arboriculture Work

Public Requirement:

- Trees are important public asset
- Public desires and needs trees
 - Public health
 - Environmental protection
 - Business success
 - Reduce certain public costs
 - Cultural practices
 - Food
 - Aesthetics
- Must be preserved, protected and maintained



Arboriculture Work

Work high and near to trees and potentially dangerous equipment is required:

- Trees grow tall and large
- Tree workers must
 - Enter and work in tall tree crowns
 - Cut and fall large trees and tree parts
 - Move, cut and chip fallen wood



Arboriculture Work

Exposes workers to potentially hazardous conditions including, but not limited to:

- Falls
- Crushing from falling/moving trees/tree parts
- Electrical contacts
- Lacerations from cutting equipment
- Animal and insect injuries



Why Safety?

- Arboriculture (35 deaths/100,000 workers/year)
 - For all industries (USA) the average fatality rate is 4 deaths /100,000/year
- Arborist: Chance of injury = 1:1,200
 - 3 times higher than Police or Fire
- Risk of serious accident (2 days in hospital or death) for tree worker = 1:120
- Tree workers experience 6.4 deaths per 100 accidents



Why Safety?

- Most common accident is “Hit by _____”
- Though the equipment has gotten safer, accident rates have gone up (Attitude or overdependence on safety equipment?)



Arboriculture Work

Work can be conducted safely with low risk of injury

- Qualified workers
- Proper tools and equipment
- Technically correct practices and procedures



Arboriculture Work

Unfortunately, work is sometimes conducted by unqualified workers and/or improper work practices

- Significantly increases risk to worker and public
- Results in injuries and sometimes fatalities
- Costs employers much money
- Damages trees
- Wastes time addressing injuries and property damage



Common Causes of Fatal Accidents

1. Struck by tree or branch
 - No safe work zone established
 - Inadequate communications
 - Improper felling practices
2. Falls – ropes or aerial platforms
 - Disconnect fall protection
 - Cut fall protection
 - Platform or boom failure
3. Electrocution
 - Inadequate tree and site inspection



Common Causes of Fatal Accidents

Root cause:

- Inadequate training, knowledge and experience
- Nonconformance with safe practices and procedures
- Improper tools or equipment
- Damaged tools or equipment



Training

The more outside training, the safer the company

- Only 1/2 of companies conduct outside safety training, but
- They have an accident rate 1/3 of other half.



Safety Attitude

Safety is an Attitude/State of Mind

- Concentration and attention to work
- Knowledge of safety equipment & practices
- Consistent, appropriate safety practices



Safety Attitude

Safety must be built into every task performed by tree workers.



Laws and Regulations

Occupational Safety and Health Act administered by
Occupational Safety and Health Administration (OSHA)



Laws and Regulations

Terminology

- Approved – Procedures described are acceptable to government
- Shall – Procedure is required
- Should – Procedure is strongly recommended



Laws and Regulations

ANSI Z133.1 Safety Standards for arborists (USA)

- Standards of safety for arborist work
- Pruning, repairing maintaining or removing trees or brush
- Recognized in USA as primary safety standard
- Reviewed and updated every 5 years



Laws and Regulations

ANSI Z133.1

- Employers must ensure regulations and policies are met
- Workers must follow all regulations



Preventing Accidents

Consider 4 main factors:

- People
- Tools
- Work technique
- Work environment



People factor most important – Employers and workers who disregard safety and ignore hazards are major cause of accidents

Duty of Care

As a tree care professional, you have the ability and duty to prevent accidents and injury

- Only permit competent persons to conduct work
- Ensure use of all proper tools and equipment
- Utilize proper practices and procedures
 - Recognize safety hazards
 - Minimize safety risk



Competent Person

Person with specific training and/or experience

- Capable of identifying existing and predictable hazards
- Within tree, site or working conditions
- Hazardous or dangerous to employees, and
- Authorized to take corrective measures to eliminate them



Competent Person

Competent Person determined by employer

- May be restricted to one or few aspects of work
- Competent person may be Qualified Arborist.



Training Requirements

Training should include:

- Qualified instructor
- Standardized training program
 - Required knowledge and skills
- Recognized by international industry authority



Training Requirements

- Adequate time for practice of knowledge, skill and equipment to develop required proficiency
- Successful demonstration of each knowledge and skill
- Documentation of training and proficiency



Training Requirements

On-the-job (OJT) accepted

- Competency Checklists

Applicant's Name: _____

Appointee's Name: _____

TREE CLIMBING SKILLS TEST EVALUATION FORM

B. ROPE THROW

TASK	PERFORMANCE CRITERIA	S	U
TREE & SITE INSPECTION Climber inspects tree & site. Evaluator's comment: "Please demonstrate inspection of the tree and site."	Check for location of utilities, wires, possible "hazards" or obstacles. Check for solid and structural tree hazards at work, trunk, canopy (dead or broken limbs, decay signs, weak crotches, cracks, etc.)		20
START TIMING Climbing line installation. Climber installs climbing rope at a pre-determined position (20-25' above the ground).	Climbing rope must be installed in position to allow the climber to safely enter the tree. (Five (5) seconds maximum). Throwline permitted.		10/100

Explanation of Point Deduction: _____

Points Deducted Section B: _____

C. SECURED ENTRY

TASK	PERFORMANCE CRITERIA	S	U
SECURED ENTRY INTO TREE Climber demonstrates secured entry into tree. Evaluator's comment: "Please demonstrate entry using body-thrust."	Means of securing acceptable. (Bodythrust with climbing hitch (use of micro pulley is acceptable).)		10/100

Explanation of Point Deduction: _____

Points Deducted Section C: _____

D. ROPE ADVANCEMENT

TASK	PERFORMANCE CRITERIA	S	U
TREE INSPECTION Climber demonstrates inspection of tree. Evaluator's comment: "Please demonstrate inspection of tree."	Verbally identify potential hazards (if any).		20
ASCEND TO FINAL PRE-DETERMINED TIE-IN POINT Climber demonstrates ascent to final, pre-determined tie-in point.	Must be secured at all times. Use accepted and safe climbing techniques. (The climber may throw rope as many times as necessary, may use pole to set rope, may climb using safety leavards).		10/100

Explanation of Point Deduction: _____

Points Deducted Section D: _____

TOTAL points deducted at this stage: _____

clock 0354

PHASE I - GROUND PERSON COMPETENCY CERTIFICATION CHECK SHEET ON-THE-JOB TRAINING

During the first few weeks that a new employee is on the job, it is important we assess his or her abilities and instruct in those areas where training is needed. This will require the joint effort of both the crew leader and the instructor, working together, to be sure the new employee works safely and performs his or her job properly.

To guide you in your on-the-job training effort the items on this form are to be initiated by both the employee and the instructor as each item is discussed and demonstrated by the instructor and then accomplished by the new employee. Items need not be covered in the same order shown on the form, but they must be covered thoroughly and in a timely manner. Refer to the Job Skills section of the Safety and Health Plan for guidance in determining the proper level of knowledge, which should be displayed.

Name of the employee: ANDREW BERLINER Foreman: CHRIS BRAMBLAGE
Date Hired: 08-11-04 Instructor: CHRIS BRAMBLAGE
Position: CLIMBER Date Completed: 12-13-04

Proper Attire

Hardhat	<input checked="" type="checkbox"/>	Long pants	<input checked="" type="checkbox"/>
High topped boots	<input checked="" type="checkbox"/>	Shirt	<input checked="" type="checkbox"/>
Eye protection	<input checked="" type="checkbox"/>	Ear Protection	<input checked="" type="checkbox"/>
Chaps	<input checked="" type="checkbox"/>		

Area Security and Work Zone Safety

Proper placement of signs, flags, cones, wheel chocks
Crew coordination in signaling motorists
Assisting driver in backing situations
Stabilizing the truck for aerial lift operations

INITIALS / DATE
CB / 12/13/04
CB / 12/13/04
CB / 12/13/04
CB / 12/13/04

Hand Tools

Proper use of handsaw
Proper use of pole saw
Proper use of pole pruner
Proper use of hand pruners
Climbing line (coil, tie, throw, etc.)
Pull Lines (directional control)
Lowering Lines (basic handling procedures)

CB / 12/13/04
CB / 12/13/04
CB / 12/13/04
CB / 12/13/04
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CB / 12/13/04
CB / 12/13/04

Chain Saw Use

Eye protection and ear protection
Clean and maintain a saw
Understands safety features (chain brake, chain catcher, throttle interlock)
Sharpen a saw
Starting procedure
Both hands on the saw
Left thumb underneath handlebar
Keeps bar tip clear (kickback zone)
Not using above head
Out of kickback path (body positioning)
Use of chain saw chaps
Use of wedges
Mixing fuel
Good balance and control
Safe distance from others
Uphill side of work
Proper limbing and bucking techniques

CB / 12/13/04
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Training Requirements

Must be on-going

- Regular, documented training applicable to job
- Recommended minimum annual re-qualification review



Training Requirements

Employers must conduct regular, documented field supervision and inspection

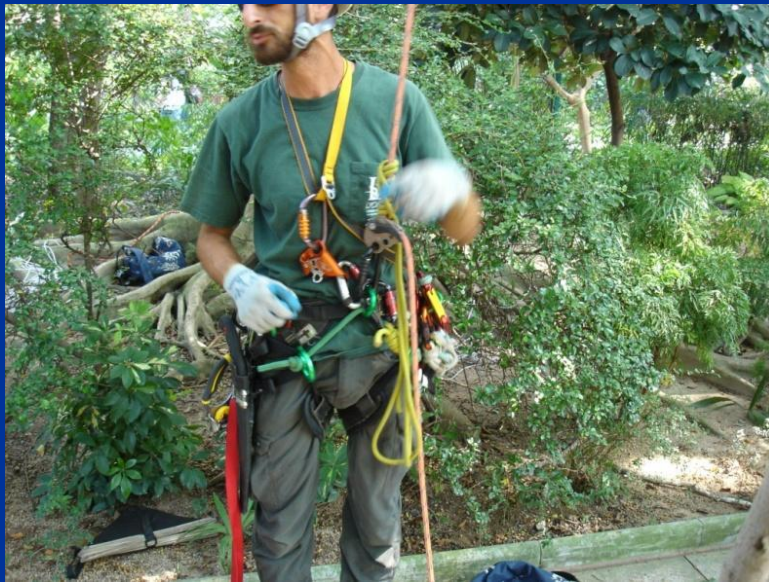
- Ensure that each employee is complying with all appropriate requirements



Training Requirements

Employees must receive additional training if:

- Non-compliance is observed or reported;
- New equipment, work practices, procedures or techniques used;
- Tools, equipment, practices, procedures or techniques that are not familiar or are applied in a different manner are used; or
- A job skill, tool, equipment, practice, procedure or technique is not used within 1 year.



Training Topics

- Applicable laws and regulations
- Safe, correct use of tools and equipment
- Safe, correct conduct of work practices
- Recognition of potential hazards for each task/tool/equipment
- Work practices to avoid or minimize safety risks.



First Aid Requirements

- Fully stocked first-aid kit, appropriate for the hazards that may be encountered
 - Must be on-site
 - Readily accessible at all times



First Aid Requirements

All employees on-site shall be instructed about the location and the use of the first aid kit



First Aid Requirements

- **Number of first-aid kits and content of each kit shall:**
 - Reflect the degree of isolation
 - Cover the number of employees
 - Address the hazards reasonably anticipated at the work site



First Aid Requirements

OSHA § 1910.266 provides a good listing of the contents of first-aid kits for crews of 2 to 3



First Aid Requirements

Employees trained how to recognize and avoid work hazards that may be encountered



First Aid Requirements

Employees shall be trained in emergency response and procedures for injuries that can result from hazards that may be encountered on the job.



Certification

Employer or its designated authority must certify that person is competent/qualified

- Certification restricted to employer
 - Not transferable
 - Not applicable beyond employer
- No person should be permitted to conduct tasks or use tools/equipment until certified competent/qualified.



Key Safety Practices

Safe operations must include:

- Tree inspection
- Site inspection
- Equipment inspection
- Work Plan
- Job brief
- Safe work practices



Tree Inspection

Workers shall inspect the tree to identify potential hazard

- Prior to conducting any work
- Whenever incidents occur that may damage tree



Tree Inspection

Process:

- Walk around entire tree to examine all tree parts
 - Roots, root crown, trunk, scaffold limbs, branches
- As climb/lift into tree – inspect for conditions not visible from ground
- While working – continue to inspect for changing conditions



Tree Inspection

Common hazards:

- Dead or broken limbs
- Signs of decay
- Cavities
- Abnormal cracks
- Cavity populating insects
- Dangerous animals/insects
- Weak branch unions
- Root collar decay
- Root damage



Tree Inspection

Pre-work inspection also used to plan tree entry and work

- Select entry method
- Select entry route
- Determine tie-in points
- Develop work plan.



Site Inspection

Workers shall inspect the site near to the tree

- Prior to conducting any work
- Whenever incidents occur that may change site
- Area that may impact or be impacted by falling wood
 - Guideline: 1.5X height of tree
- Identify potential site hazards to workers
- Identify potential targets within fall zone of tree



Site Inspection

Common site hazards include:

- Electric lines
- Chemical storage
- Natural gas or petrol storage
- Tripping obstacles
- Vehicles
- Puncture hazards (fences, stakes, rebar, etc.)
- Steep terrain or pits
- Dangerous animals and insects
- Weather conditions



Site Inspection

Common potential targets within fall zone of tree may include:

- People
- Vehicle
- Structures
- Valuable man-made or natural objects.



Work Plan

Based findings from inspections, develop work plan

- Safety first focus
- What work will be conducted
- Where work will be conducted
- Required tools and equipment, including PPE
- Work process and progression



Work Plan

- Each workers' role, responsibility and location
- Communication plan and process
- Identification of all potential hazards
- Prescriptive safety measures for each job
 - Amend if work or site conditions change.



Job Briefing

Meet with all workers involved with work and review:

- Work plan with emphasis on
 - Each workers' role, responsibility and location
 - Communication plan and process
 - Identification of all potential hazards
 - Prescriptive safety measures
- Ensure that all workers understand and can conform



Good Communication

Safe work zone

- Landing zone
- Drop zone



Job Briefing

Do not commence work if all tasks cannot be conducted safely

- Adequate number and qualification of workers
- All required tools/equipment present & good condition
- Unsafe site conditions mitigated.



Tool and Equipment Inspection

Workers shall inspect all tools and equipment prior to use

- Use only tools/equipment proper for the tasks
 - Do not adapt tool/equipment not designed for use
- Ensure that it is in good working condition
 - According to manufacturer's design and function
 - Use visual and touch methods



Tool and Equipment Inspection

- Ensure no significant defects or damage
 - Thresholds must be adequately defined
- Re-inspect if incident occurs that may damage tool/equipment.



Personal Protective Equipment

Whenever recognized hazard exists:

- Conform to National Standard
- Protect from exposures



Head Protection (Helmets)

Construction or electric class, conforming to OSHA standard

- Marker in helmet identifies standard

Inspect for:

- Cracks or holes
- Shock webbing
- Shell integrity



Eye Protection

Protect from projectiles and eye incursions

- Marker in glasses identifies if ANSI Z87.1 conforming

Inspect for:

- Clear vision
- Working condition



Hearing Protection

When noise levels exceed 85 decibels

- Label on container identifies noise levels protected
- Chain saws & chippers

Inspect for:

- Elasticity
- Proper seal



Gloves

Sturdy gloves

- Proper durability for hazard
- Proper size for worker

Inspect for:

- Cuts and damage



Chain Saw Chaps

Whenever using a chain saw on the ground

- Special mesh material
 - Jam sprocket and stop chain
- Proper size for worker

Inspect for:

- Cuts of interior mesh
- Integrity of fasteners



Work Boots

Sturdy, leather boots

- Tough cover
- Firm ground grip

Inspect for:

- Cuts and damage
- Proper sole attachment
- Sizing.



General Safe Work Practices



Working in Trees

Tree work is dynamic and variable

- No 2 situations are identical
- To identify proper work practices and safety procedures for each situation, tree workers must use:
 - Knowledge
 - Training
 - Experience
 - Good judgment



General Safe Work Practices

Prevent accidents

- Adequate tree and site inspection
- Establish safe work zone
- Two-way communications
- Electric hazard awareness
- Crushing avoidance
- Correct pruning and felling practices



Adequate Tree-Site Inspection

Required by law and good judgment

- Comprehensive and thorough
- Identify potential hazards
- Avoid injury and property damage



Establish Safe Work Zone

Barricade and protect workers and property

- Ensure all workers understand operations & restrictions
- Prevent unauthorized entry during work
- Manage work within barriers



Two-way Communications

Establish and conform to procedures

- Define command and response system and language
- Apply whenever potentially hazardous activities occur
 - Examples: felling tree or branch, equipment movement



Good Communication

Command and Response System

- Warning signals given (“stand clear!” “headache!”)
- Response to warning (“all clear!”)
- Multiple workers may require one key worker to ensure clear and respond



Good Communication

Command and Response System

- Noisy work site
 - Hand signals
 - Whistles
 - Sticks
 - Throw “Cookies”.



Crushing Avoidance

Monitor potential crush points

- Before move platform boom, check pinch points
- Use assistant to direct and guide equipment movement
- Carefully plan branch and tree felling



Emergency Response - Aerial Rescue



Whenever Emergency Occurs

- Suspend operations
- Secure the site – ensure all persons safe
- Notify emergency services
- If injuries, take appropriate action
- Take action to repair and recover



Aerial Rescue

Issues and challenges unique to tree industry

- Victim often high above ground
- Often inaccessible
- Victim relies on co-workers
 - Quickly identify trouble
 - Safely and quickly lower to ground
 - Procure professional help quickly



Knowledge Requirement

All workers must be trained and proficient in aerial rescue practices and procedures

- Never attempt aerial rescue unless you are sure it can be done safely



Rescue Planning

Plan every job as if you will need to perform an aerial rescue



Rescue Procedures

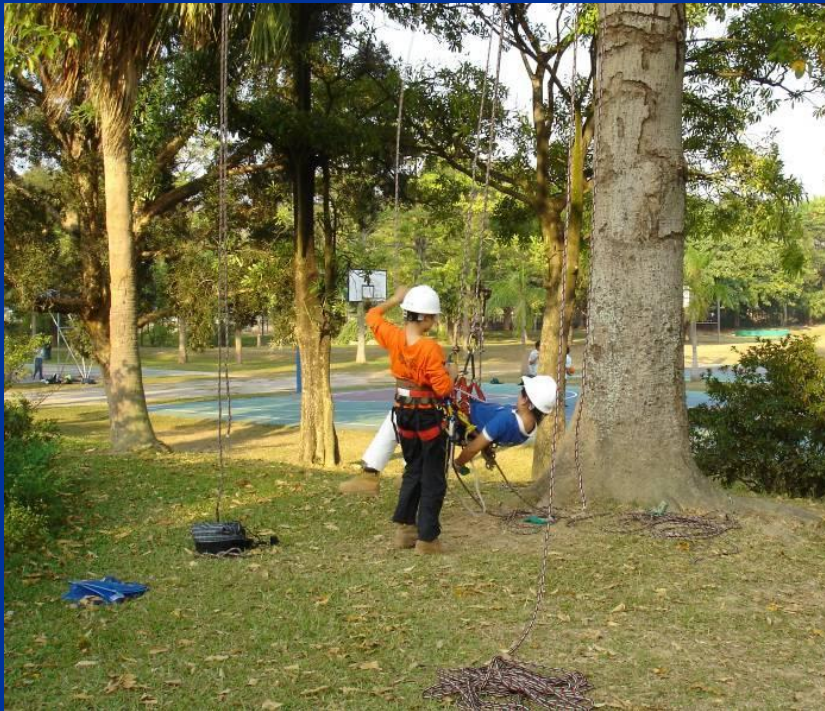
1. Verify incident – determine if worker requires help
2. Determine cause of injury
 - Ensure no longer a hazard
3. Use extreme caution to ensure rescuer does not become second victim



Rescue Procedures

4. If possible, recruit help immediately

- Call 911
- Most important action to get professional help ASAP



Reaching the Victim

General rule: Safest, fastest method

- Speed is essential if:
 - Cardiac arrest
 - Heavy bleeding
 - No breathing
 - Other serious injury
- Brain damage ~ 4 to 6 minutes with no oxygen



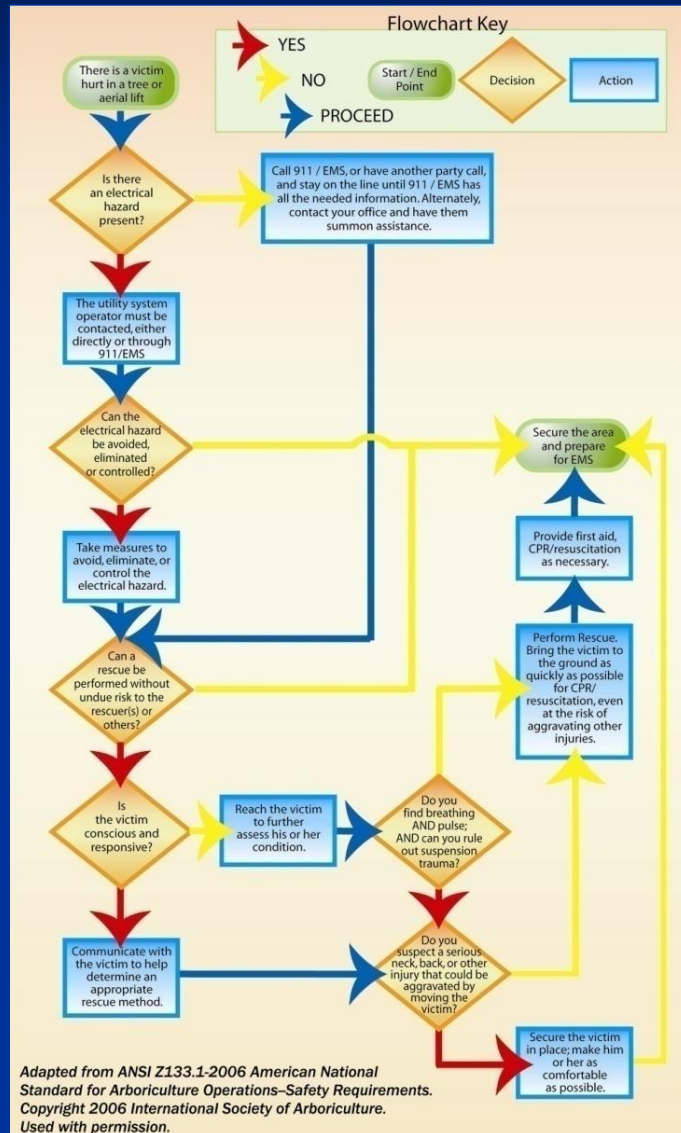
Emergency Equipment

Necessary equipment should always be handy

- Easily accessible (not in vehicle)
- In good condition
 - Clean, dry rope
 - Saddle
 - Throw-line and throwbag
 - Non-conductive ladder (?)
 - Pole pruner with non-conductive handle
 - Pocket knife
 - Climbing spurs



Aerial Rescue Flow Chart



From ANSI Z133.1-2006
Annex F

Practice Aerial Rescue

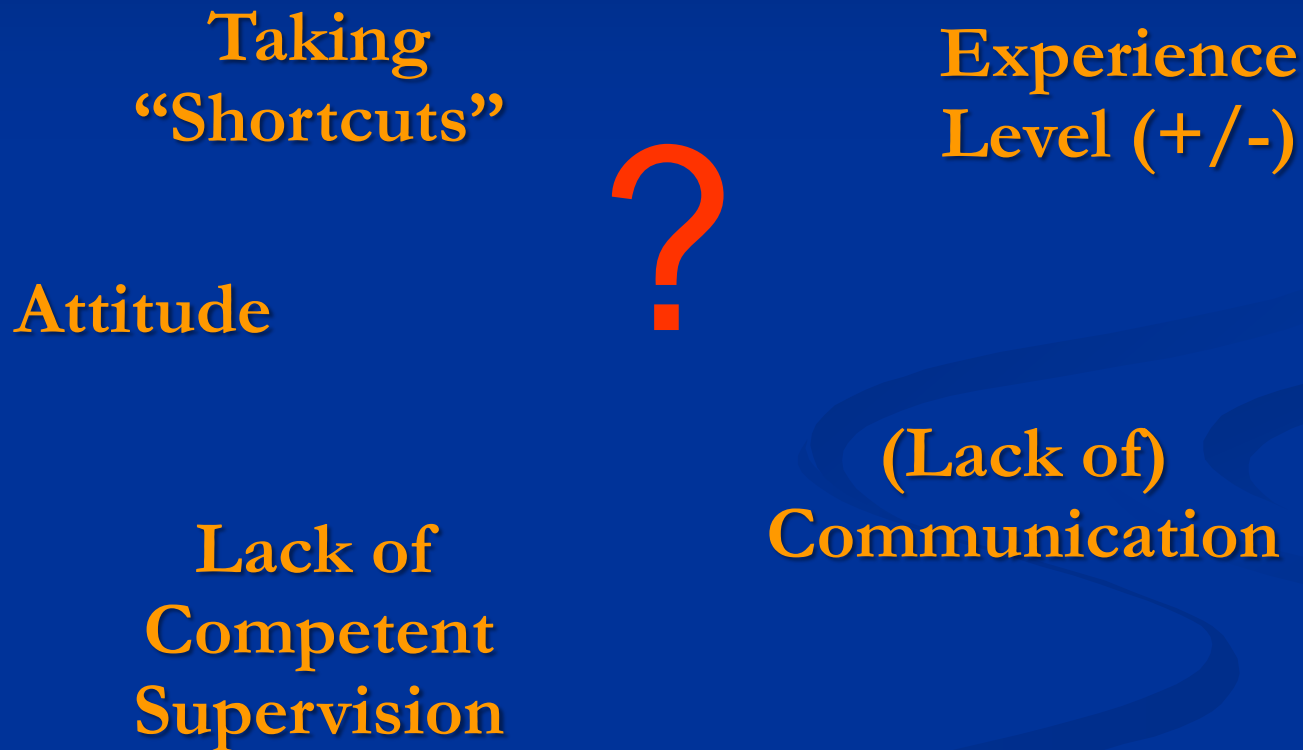
Once per month at least

- Review procedures
- Physical drills
- Actual conditions
- Entire crew involved.



How do Accidents Happen?

Root Causes



Safety Program Elements

Develop and maintain safety program

- Create a safety culture that helps employees to avoid hazards
- Management commitment
- Employee involvement
- Clear guidelines & training
- Inspection & maintenance
- Enforcement
- Documentation & follow-up



Basic Rules

Do not conduct any tree work unless:

- **Personnel properly qualified for the job being conducted**
- **Tree and site inspected & all hazards recognized and addressed**
- **Proper tools/equipment on-site & in good working condition**
- **All workers understand work plan and personal duties**
- **Conform to all safety practices for conditions at all times.**



Prevent Accidents

Consider 4 main factors:

- People – Qualified and committed – Proper attitude
- Tools – Proper for work in good working order
- Work technique – Safe and technically correct
- Work environment - Safe



People factor most important – Workers who disregard safety and ignore hazards are major cause of accidents.

General Arboriculture Safety Standards and Practices

Always:

- Work safe
- Work smart
- Conduct quality work
- Be professional



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